## Space Weather Forecast

Issued on Sunday, 02 June 2024 at 12:24 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Moderate to High solar activity with further Moderate or Strong flares likely. Glancing Coronal Mass Ejection (CME) impacts possible into the period with a chance of G1/G2 Minor or Moderate Geomagnetic Storms.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Remains High with a further Strong flare observed at 01/1836 UTC, and a long period Moderate flare, peaking at 01/1940 UTC, both from the larger regions in the southeast disc. There are now eight numbered spots on the disc and one unnumbered, with a NEW region rounding the northeast limb. The larger region in the southeast persists as the most notable spot, although recent weakening trends have continued. The next most complex groups are in the southwest. Both are somewhat magnetically complex, with some ongoing growth and consolidation. Other regions on the disc are smaller, simpler and appear more stable at this time.

The Strong flare at 01/1836 UTC from the region in the southeast was followed by a long period Moderate flare from the same region, peaking at 01/1940 UTC. A large CME was observed from Earth's frame of reference around the time of the first flare but has been assessed as far-sided, with the second flare resulting in a smaller CME, potentially Earth-directed but apparently more displaced towards the south and east. Analysis of this second feature suggest the potential for a glancing impact sometime later on day 3 (04 Jun). No other Earth-directed CMEs observed in available imagery.

**Solar Wind / Geomagnetic Activity:** Solar winds persisting at background levels, varying between 310-360km/s. The Interplanetary Magnetic Field strength was generally weak with the important north-south component also varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms occurring.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** High to Moderate activity is forecast with further Moderate class expected and a chance of isolated Strong class flares, mainly from the complex sunspot in the southeast.

**Solar Wind / Geomagnetic Activity:** A weak CME from a flare on 31 May is expected either late day 1 or early day 2 (02-03 Jun), although confidence is low with the strength of any arrival due to the faint and apparent weak nature of the CME. Analysis of a CME associated with a flare from the complex sunspot region in the southeast, peaking at 01/1940 UTC, suggest the potential for a glancing impact sometime later on day 3 (04 Jun). Otherwise largely background winds are likely to persist, with a chance of becoming slightly enhanced for a time between days 1 and 2 (02-03 Jun), however this is also low confidence.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic activity is forecast to be mainly Quiet initially, but perhaps increasing to give Unsettled to Active intervals with any faster wind onset days 1-2 (02-03 Jun) or weak CME arrival, with a slight chance of G1 Minor Storm intervals. The risk of Active conditions increases into day 3 (04 Jun), with an increased chance of G1-G2 Minor to Moderate Strom intervals associated with any CME arrival, this risk easing into day 4 (05 Jun).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of rising above the S1 Minor Storm level in response to any further notable flares.

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 20 | 20 | 50 | 20 |
| Strong | G3 | No | 1 | 1 | 5 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 80 | 75 | 70 | 65 |
| Very Active | R3 to R5 X | Yes | 40 | 35 | 30 | 25 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 20 | 20 | 20 | 20 |
| Very Active | ≥ S3 * | No | 5 | 5 | 5 | 5 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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